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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/550,642	04/14/2000	David F. Sorrells	1744.0920001	9236

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EXAMINER

ODOM, CURTIS B

ART UNIT	PAPER NUMBER
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2634

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DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/550,642

Applicant(s)

SORRELLS ET AL.

Examiner

Curtis B. Odorn

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 75-119 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 75,76,78-87,89-100,102-110 and 112-119 is/are rejected.
- 7) ☐ Claim(s) 77,88,101 and 111 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 12/18/02 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

3. Claims 99 and 115 are objected to because of the following informalities: The phrase "the resonant structure" is suggested to be changed to "a resonant structure". Appropriate correction is required.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 1/18/03 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

3. Claims 99 and 115 are objected to because of the following informalities: The phrase "the resonant structure" is suggested to be changed to "a resonant structure". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 75, 76, 78-87, 89-100, 102-110, and 112-119 are rejected under 35 U.S.C. 102(e) as being anticipated by Long (U. S. Patent No. 6, 026, 286).

Regarding claim 75, Long discloses an apparatus (Fig. 4 and 5, column 6, lines 3-67) for down-converting an electromagnetic signal, wherein an RF signal is an electromagnetic signal, comprising:

a capacitor (Fig. 5, element 536) having a first and second port;

a switching device (Fig. 5, blocks 516, 520, and 526) having a first, second and third port; and

a resonant structure having a first and second port (Fig. 5, elements 510 and 513, column 23, lines 46-48);

wherein the first port of the capacitor is electrically coupled to the second port of the switching device, and the first port of the resonant structure is electrically coupled to the first port of the switching device (Figs. 5, column 6, lines 18-67); and

wherein a control signal (Fig. 5, LO) is electrically coupled to the third port of the switching device, and an RF source signal (Fig. 5, RFin) is electrically coupled to the first port of the resonant structure.

Regarding claim 76, which inherits the limitations of claim 75, Long does not disclose a value of capacitance for the capacitor is selected so that the capacitor discharges stored energy to a load when the switching device is open. However, Long discloses a capacitor coupled to a switching device (Fig. 4, elements 436 and 412) connected in series with a load (Fig. 4, element 438, column 6, lines 13-16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that in order for the device to function properly the value of the capacitor would need to be correctly calculated for the capacitor to function properly. Thus, choosing a value for the capacitor is deemed a design choice and does not constitute patentability.

Regarding claim 78, which inherits the limitations of claim 75, Long does not disclose the duration of an aperture of the switching device is nominally equal to one-half of a period of the electromagnetic signal. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that since the duration of the aperture is chosen to provide suitable conductance in the transistor (switching device) that an aperture would have been chosen to optimize the use of the transistor. Thus, choosing an aperture duration is deemed a design choice and does not constitute patentability.

Regarding claim 79, which inherits the limitations of claim 75, Long discloses the first port of the capacitor is electrically coupled to an impedance matching network (Fig. 5, blocks 536 and 553, column 16, lines 20-23).

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Regarding claim 80, which inherits the limitations of claim 75, Long discloses the first port of the capacitor is electrically coupled to an amplifier (Fig. 4, and Fig. 5, block 536, column 5, line 63-column 6, line 67).

Regarding claim 81, which inherits the limitations of claim 75, Long discloses the first port of the resonant structure is coupled to an impedance matching network (Fig. 5, blocks 510, 513, and 553).

Regarding claim 82, which inherits the limitations of claim 75, Long discloses the switching device is a transistor (Fig. 5, blocks 516, 520, and 526, column 6, lines 18-67),

Regarding claims 83-85, which inherit the limitations of claim 75, Long does not disclose the switching device is a FET, JFET, or MOSFET. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that since these are all transistors, that each of these devices could have been used to perform the switching function. Thus, choosing a type of transistor is deemed a design choice and does not constitute patentability.

Regarding claim 86, Long discloses an apparatus (Fig. 4 and 5, column 6, lines 3-67) for down-converting an electromagnetic signal, wherein an RF signal is an electromagnetic signal, comprising:

- a first (Fig. 5, element 536) and second (Fig. 5, element 542) capacitor each having a first and second port;

- a switching device (Fig. 5, elements 516, 520, and 526) having a first, second and third port; and

- a resonant structure having a first and second port (Fig. 5, elements 510 and 513, column 23, lines 46-48);

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wherein the first port of the first capacitor is electrically coupled to the second port of the switching device, the first port of the second capacitor is electrically coupled to the first port of the switching device, the second port of the second capacitor is electrically coupled to the second port of the switching device, and the first port of the resonant structure is electrically coupled to the first port of the switching device (Figs. 5, column 6, lines 18-67); and

wherein a control signal (Fig. 5, LO) is electrically coupled to the third port of the switching device, and an RF source signal (Fig. 5, RFin) is electrically coupled to the first port of the resonant structure.

Regarding claims 87 and 89-96, which inherit the limitations of claim 86, the claimed device includes features corresponding to subject matter mentioned above in the rejection of claims 76 and 78-85 which is applicable hereto.

Regarding claim 97, discloses an apparatus (Fig. 4 and 5, column 6, lines 3-67) for down-converting an electromagnetic signal, wherein an RF signal is an electromagnetic signal, comprising:

a capacitor (Fig. 5, element 536) having a first and second port;

a first and second switching device (Fig. 5, 520, and 526) each having a first, second and third port; and

wherein the first port of the capacitor is electrically coupled to the second port of the first switching device, and the second port of the capacitor is electrically coupled to the second port of the second switching device, and the third port of the first switching device is electrically coupled to the third port of the second switching device (Figs. 5, column 6, lines 18-67); and

wherein a control signal (Fig. 5, LO) is electrically coupled to the third port of the first switching device and the third port of the second switching device, and an RF source signal (Fig. 5, RFin) is electrically coupled to the first port of the first switching device and the first port of the second switching device (Fig. 5, column 6, lines 18-67).

Regarding claim 98, which inherits the limitations of claim 97, Long discloses a resonant structure having a first and second port (Fig. 5, elements 510 and 513, column 23, lines 46-48),

wherein the first ports of the resonant structure is electrically coupled to the first port of the first switching device and second port of the resonant structure is coupled to the first port of the switching device.

Regarding claim 99, which inherits the limitations of claim 97, Long discloses a first and second impedance each having a first and second port (Fig 5, blocks 550 and 552, column 7, lines 1-6),

wherein the first port of the first impedance is electrically coupled to the first port of a resonant structure and the first port of the second impedance is electrically coupled to the second port of a resonant structure (Fig. 5), and

wherein an RF source signal (Rfin) is electrically coupled to the second port of the first impedance and the second port of the second impedance.

Regarding claims 100, 102, and 103, which inherit the limitations of claim 97, the claimed device includes features corresponding to subject matter mentioned above in the rejection of claims 76, 78, and 80 which is applicable hereto.

Regarding claim 104, which inherits the limitations of claim 97, Long discloses the first and second ports of the capacitor is electrically coupled to the first and second ports of a

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differential amplifier amplifier (Fig. 4, and Fig. 5, block 536, column 5, line 63-column 6, line 67).

Regarding claim 105, which inherits the limitations of claim 97, Long discloses the first and second switching devices are transistors (Fig. 5, blocks 520, and 526, column 6, lines 18-67),

Regarding claims 106-108, which inherit the limitations of claim 97, Long does not disclose the switching device is a FET, JFET, or MOSFET. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that since these are all transistors, that each of these devices could have been used to perform the switching function. Thus, choosing a type of transistor is deemed a design choice and does not constitute patentability.

Regarding claim 109, Long discloses an apparatus (Fig. 4 and 5, column 6, lines 3-67) for down-converting an electromagnetic signal, wherein an RF signal is an electromagnetic signal, comprising:

- a first (Fig. 5, element 536) and second (Fig. 5, element 542) capacitor each having a first and second port;

- a switching device (Fig. 5, elements 516, 520, and 526) having a first, second and third port; and

- a load (Fig. 4, element 438, column 6, lines 13-16);

wherein the first port of the first capacitor is electrically coupled to the second port of the switching device, the first port of the second capacitor is electrically coupled to the first port of the switching device, the second port of the second capacitor is electrically coupled to the second

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port of the switching device, and the second port of the second capacitor is electrically coupled to the second port of the switching device (Figs. 5, column 6, lines 18-67); and

wherein a control signal (Fig. 5, LO) is electrically coupled to the third port of the switching device, and an RF source signal (Fig. 5, RFin) is electrically coupled to the first port of the resonant structure.

Regarding claims 110 and 112-119, which inherit the limitations of claim 103, the claimed device includes features corresponding to subject matter mentioned above in the rejection of claims 76 and 78-85 which is applicable hereto.

Allowable Subject Matter

6. Claims 77, 88, 101, and 111 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kashima (U.S. Patent No. 6, 178, 319) discloses a circuit for down-converting electromagnetic signals.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 703-305-4097. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 709-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Curtis Odom
September 24, 2003



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